ACOUSTICAL SITE ASSESSMENT
TPM 21030 RESIDENTIAL DEVELOPMENT – SAN DIEGO, CA

Submitted to:

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Prepared by:

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ISE Project #07-003

March 17, 2008 (Revised)

INTRODUCTION AND DEFINITIONS

Existing Site Characterization

The project site consists of approximately 1.4-acres located in the southern portion of the township of Lakeside within the County of San Diego, California. Los Coches Road borders the project site to the west. Los Coches Road via Interstate 8 (I-8) provides regional access to the project area as can be seen in Figures 1 and 2 below.

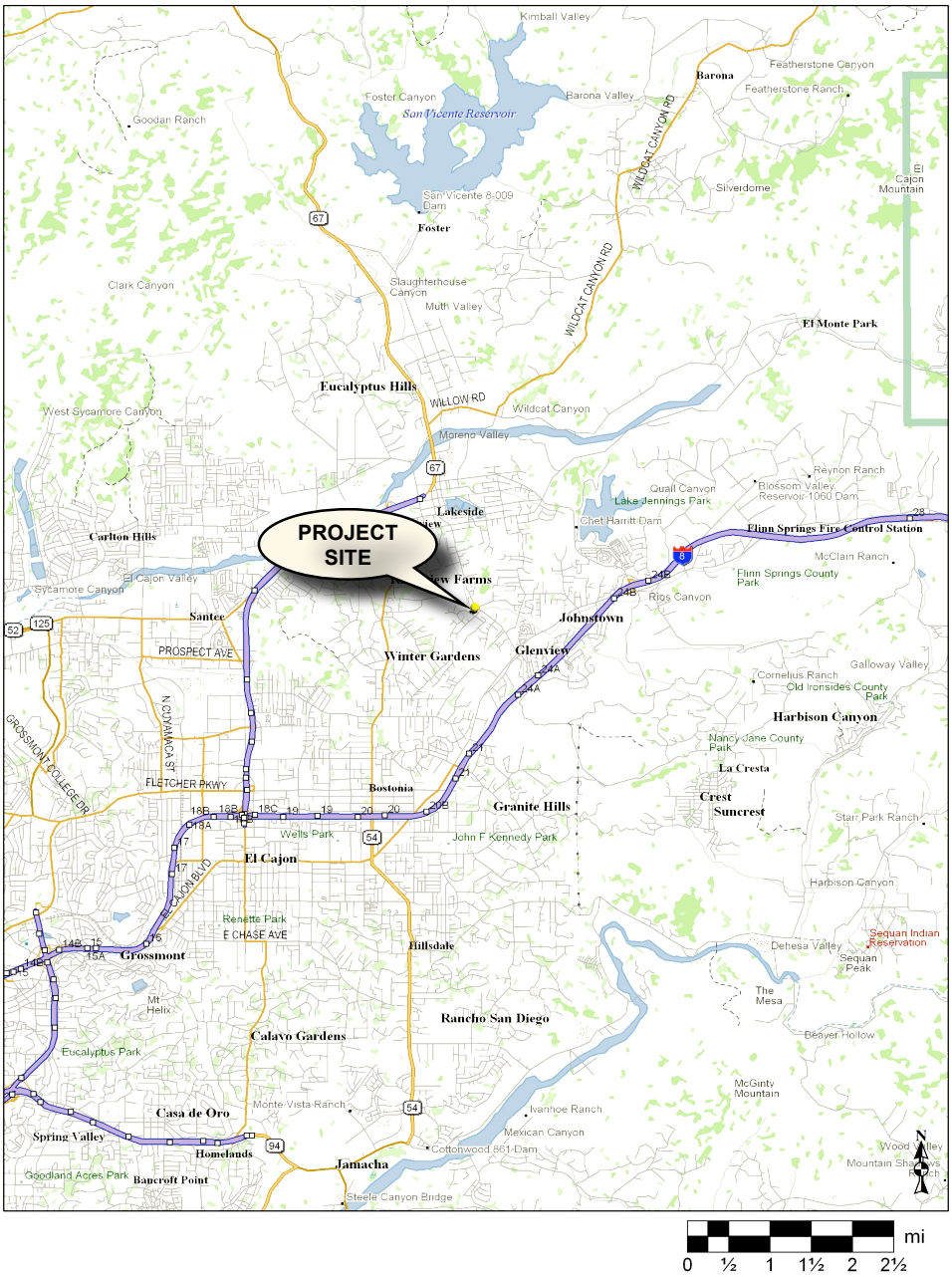


FIGURE 1: Project Vicinity Map (ISE 2/07)

The project site currently resides as undeveloped open area with no noise sources on-site. The elevations across the entire property range from approximately 450 to 469 feet above mean sea level (MSL) as is also illustrated below in Figure 2.

FIGURE 2: Project Site Location Map (ISE 2/07)

Project Description

The proposed project calls for the subdivision of a 1.4-acre Tentative Parcel Map into three residential parcels. Zoning for the site is RS4 – Single-Family Residential. The project site is located in the Lakeside Community Planning Group, within unincorporated San Diego County. The proposed site development plan can be seen in Figure 3 below. The northern parcel is designed to include a two story structure while the remaining two parcels will only have a single story structure.

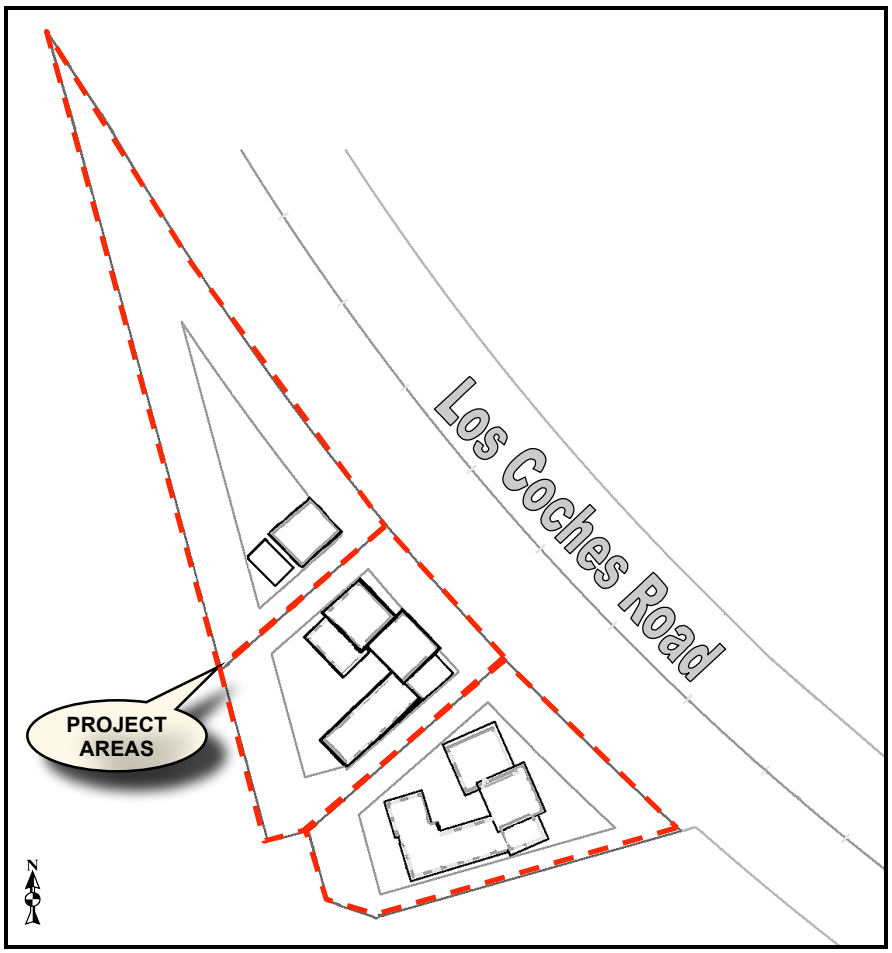


FIGURE 3: Proposed Site Plan – TPM 21030 (Martin and Ziemaniak Engineering 2/07)

Acoustical Definitions

Sound waves are linear mechanical waves. They can be propagated in solids, liquids, and gases. The material transmitting such a wave oscillates in the direction of propagation of the wave itself. Sound waves originate from some sort of vibrating surface. Whether this surface is the vibrating string of a violin or a person's vocal cords, a vibrating column of air from an organ or clarinet, or a vibrating panel from a loudspeaker, drum, or aircraft, the sound waves generated are all similar. All of these vibrating elements alternatively compress the surrounding air on a forward movement and expand it on a backward movement.

There is a large range of frequencies within which linear waves can be generated, sound waves being confined to the frequency range that can stimulate the auditory organs to the sensation of hearing. For humans this range is from about 20 Hertz (Hz or cycles per second) to about 20,000 Hz. The air transmits these frequency disturbances outward from the source of the wave. Sound waves, if unimpeded, will spread out in all directions from a source. Upon entering the auditory organs, these waves produce the sensation of sound. Waveforms that are approximately periodic or consist of a small number of periodic components can give rise to a pleasant sensation (assuming the intensity is not too high), for example, as in a musical composition.

Noise, on the other hand, can be represented as a superposition of periodic waves with a large number of components and is generally defined as unwanted or annoying sound that is typically associated with human activity and which interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the sensitivity of the individual hearing the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric levels. The loudest sounds the human ear can hear conformably are approximately one trillion times the acoustic energy that the ear can barely detect. Because of this vast range, any attempt to represent the acoustic intensity of a particular sound on a linear scale becomes unwieldy. As a result, a logarithmic ratio originally conceived for radio work known as the decibel (dB) is commonly employed.

A sound level of zero “0” dB is scaled such that it is defined as the threshold of human hearing and would be barely audible to a human of normal hearing under extremely quiet listening conditions. Such conditions can only be generated in anechoic or “dead rooms”. Typically, the quietest environmental conditions (extreme rural areas with extensive shielding) yield sound levels of approximately 20 decibels. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB roughly correspond to the threshold of pain.

The minimum change in sound level that the human ear can detect is approximately 3 dB. A change in sound level of 10 dB is usually perceived by the average person as a doubling (or halving) of the sounds loudness. A change in sound level of 10 dB actually represents an approximately 90 percent change in the sound intensity, but only about a 50 percent change in the perceived loudness. This is due to the nonlinear response of the human ear to sound.

As mentioned above, most of the sounds we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate the sound we hear. The method commonly used to quantify environmental sounds consists of determining all of the frequencies of a sound according to a weighting system that reflects the nonlinear response characteristics of the human ear. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (or dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of sounds from distant sources that create a relatively steady background noise in which no particular source is identifiable. For this type of noise, a single descriptor called the Leq (or equivalent sound level) is used. Leq is the energy-mean A-weighted sound level during a measured time interval. It is the 'equivalent' constant sound level that would have to be produced by a given source to equal the average of the fluctuating level measured. For most acoustical studies, the monitoring interval is generally taken as one-hour and is abbreviated *Leq-h*.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L10 typically describe transient or short-term events, while levels associated with the L90 describe the steady state (or most prevalent) noise conditions. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum and minimum measured sound level (Lmax and Lmin) indicators. The Lmin value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

Finally, another sound measure employed by the State of California and the County of San Diego is known as the Community Noise Equivalence Level (CNEL) is defined as the "A" weighted average sound level for a 24-hour day. It is calculated by adding a 5-decibel penalty to sound levels in the evening (7:00 p.m. to 10:00 p.m.), and a 10-decibel penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours.

APPLICABLE SIGNIFICANCE CRITERIA

Vehicular/Transportation Noise Impact Thresholds

Transportation noise levels, such as those produced by vehicles traveling to and from the project site, are governed under Policy 4b of the *County of San Diego's Noise Element of the County's General Plan (as revised 7/06)*. The relevant sections of the Noise Element are cited below:

> Because exterior community noise equivalent levels (CNEL) above 60 decibels and/or interior CNEL above 45 decibels may have an adverse effect on public health and welfare, it is the policy of the County of San Diego that:
>
> 1. Whenever it appears that new *development* may result in any (existing or future) *noise sensitive land use* being subject to noise levels of CNEL equal to 60 *decibels (A)* or greater, an acoustical analysis shall be required.
> 2. If the acoustical analysis shows that noise levels at any *noise sensitive land use* will exceed CNEL equal to 60 decibels, modifications shall be made to the *development* which reduce the *exterior noise* level to less than CNEL of 60 *decibels (A)* and the *interior noise* level to less than CNEL of 45 *decibels (A)*[1].
> 3. If modifications are not made to the *development* in accordance with paragraph 2 above, the *development* shall not be approved unless a finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without such modification; provided, however, if the acoustical study shows that sound levels for any noise sensitive land use will exceed a CNEL equal to 75 *decibels (A) even* with such modifications, the *development* shall not be approved irrespective of such social or economic considerations.
>
> Definitions, Notes and Exceptions
>
> *"Decibels (A)"* refers to A-weighted sound levels as noted on page VIII-2 within the Element.
>
> *"Development"* means any physical development including but not limited to residences, commercial, or industrial facilities, roads, civic buildings, hospitals, schools, airports, or similar facilities.

[1] **Action Program 4b1:** Recommend programs to soundproof buildings or redevelop areas where it is impossible to reduce existing source noise to acceptable levels.

Action Program 4b2: Study the feasibility of extending the application of Section 1092, California Administrative Code dealing with noise insulation standards to single-family dwellings, and incorporating higher standards for reduction of exterior noise intrusion into structures.

Action Program 4b3: Require present and projected noise level data to be included in Environmental Impact Reports. Designs to mitigate adverse noise impacts shall also be used.

"*Exterior noise*":

(a) For single family detached dwelling projects, "exterior noise" means noise measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

(i) Net lot area up to 4,000 sq. ft.:	400 square feet.
(ii) Net lot area 4,000 sq. ft. to 10 ac.:	10% of net lot area.
(iii) Net lot area over 10 ac.:	1 ac.

(b) For all other projects, "exterior noise" means noise measured at all exterior areas, which are provided for group or private usable, *open space* purposes.

(c) For County road construction projects, the exterior noise level due to vehicular traffic impacting a noise sensitive area should not exceed the following values:

(i) Federally funded projects: The Noise standard contained in applicable Federal Highway Administration Standards.

(ii) Other projects: 60 *decibels (A),* except if the existing or projected noise level without the project is 58 decibels (*A*) or greater, a 3 *decibel* (*A*) increase is allowed, up to the maximum permitted by Federal Highway Administration Standards.

"Group or Private Usable Open Space" shall mean: Usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways (Group Usable Open Space); and usable open space intended for use of occupants of one dwelling unit, normally including yards, decks and balconies (Private Usable Open Space).

"Interior noise": The following exception shall apply: For rooms which are usually occupied only a part of the day (schools, libraries, or similar), the interior one-hour average sound level, due to noise outside, should not exceed 50 *decibels (A)*.

"Noise sensitive land use" means any residence, hospital, school, hotel, resort, library or any other facility where quiet is an important attribute of the environment.

State of California CCR Title 24 Noise Insulation Standards

The California Code of Regulations (CCR), Title 24, Noise Insulation Standards, states that multi-family dwellings, hotels, and motels located where the CNEL exceeds 60 dBA, must obtain an acoustical analysis showing that the proposed design will limit interior noise to less than 45 dBA CNEL. Interior noise standards are typically applied to sensitive areas within the structure where low noise levels are desirable (such as living rooms, dining rooms, bedrooms, and dens or studies).

Worst-case noise levels, either existing or future, must be used for this determination. Future noise levels must be predicted at least ten years from the time of building permit application. The County of San Diego has adopted the CCR Title 24 standards as part of their Policy 4b implementation.

ANALYSIS METHODOLOGY

Existing Conditions Field Survey

A Quest Model 2900 ANSI Type 2 integrating sound level meter was used as the data collection device. The meter was mounted to a tripod five-feet above ground level in order to simulate the noise exposure of an average-height human being. One short-term sound level measurement was taken on the proposed site as described below.

Meter Location 1 (denoted as ML 1) was located in the south portion of the site roughly 75 feet west of Los Coches Road and can be seen in Figure 4 on the following page. The monitoring was done in this manner in order to obtain an estimate of the worst-case existing onsite noise during normal daytime traffic conditions.

The measurement was performed on January 18, 2007. All monitoring sites were spatially logged using a geographic positioning system (GPS) in order to maintain horizontal and vertical control. All equipment was calibrated before testing at ISE's acoustics and vibration laboratory to verify conformance with ANSI S1-4 1983 Type 2 and IEC 651 Type 2 standards.

Traffic Noise Impact Assessment Approach

The *Traffic Noise Model version 2.5* (TNM 2.5) based on FHWA-PD-96-010 and FHWA/CA/TL-87/03 standards was used to calculate future onsite vehicular traffic noise levels. These components are supported by a scientifically founded and experimentally calibrated acoustic computation methodology. The database is made up of over 6,000 individual pass-by events measured at forty sites across the country. Currently TNM 2.5 is the only noise-modeling program accepted by Caltrans for use within the State of California.

Receptor elevations were considered five feet above the appropriate floor (pad) elevation and were taken near the center of each proposed lot (i.e., within all Noise Sensitive Areas, NSA's). The receptor locations can be seen in Figure 5 on Page 10 of this report. The TNM model input and output files required for the analysis is provided at the end of this technical report.

FIGURE 4: Ambient Monitoring Location – TPM 21030 Residential Development (ISE 2/07)

Input to the acoustical model includes the following:

- A digitized representation of all major roadways.
- Future Average Daily Trips (ADTs) for nearby major roadways (*Source: SANDAG Series 10 – 2030 Enhanced Traffic Prediction Model*).
- A 95/2/1/1/1 (automobiles/medium/heavy/bus/motorcycle vehicles) traffic mix in accordance with CALTRANS.
- A peak hour traffic percentage of 10% of the ADT (for values between approximately 8 and 12 percent, the energy-mean A-weighted sound level is equivalent to the CNEL. Outside this range, a maximum variance of up to two dBA occurs between Leq-h and CNEL).
- Receptor and topographic elevations as identified in the project site plans (*Source: Martin and Ziemaniak*).

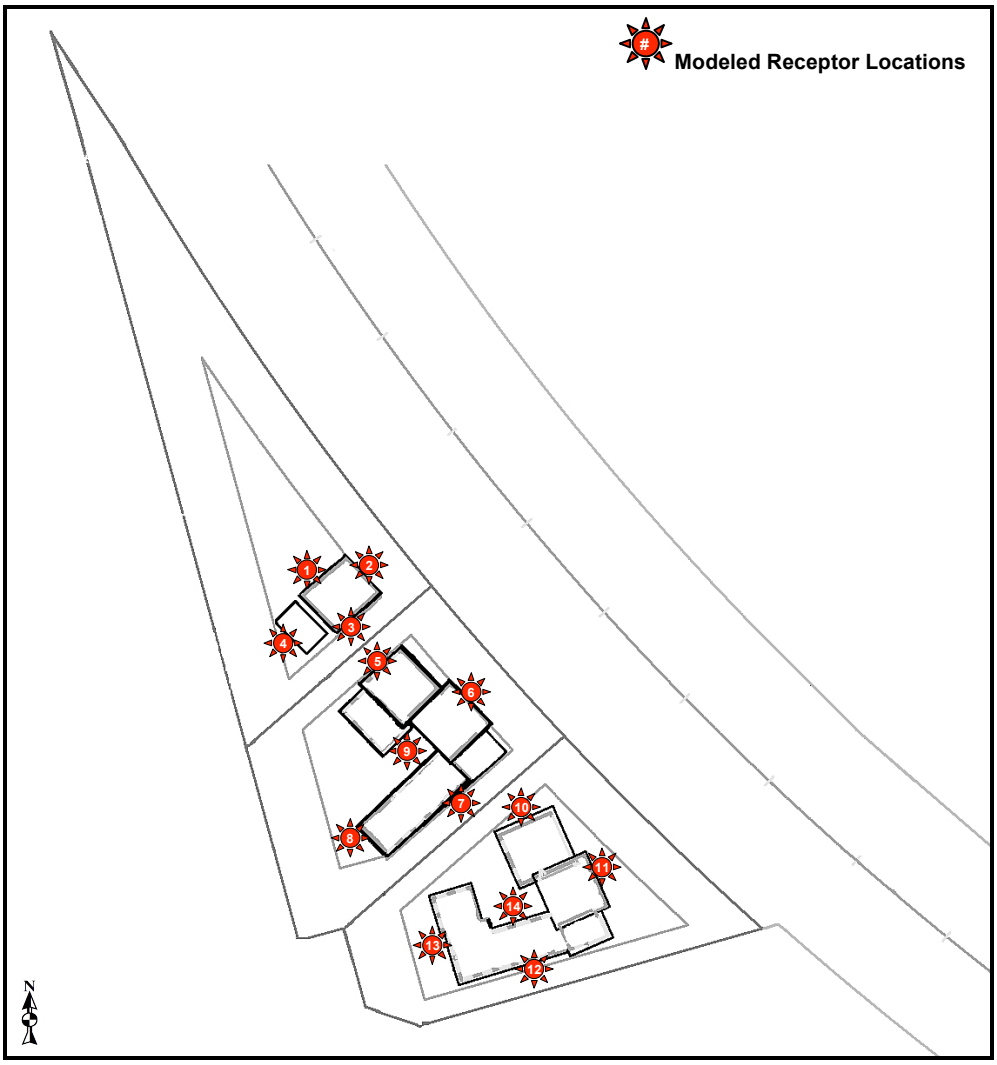


FIGURE 5: Modeled Receptor Locations for TPM 21030 Residential Development (ISE 1/07)

FINDINGS / RECOMMENDATIONS

Ambient Sound Measurement Results

Testing conditions during the monitoring period were sunny with an average barometric pressure reading of 30.01 in-Hg, an average westerly wind speed of 1 to 3 miles per hour (MPH) and an approximate mean temperature of 65 degrees Fahrenheit. The results of one-hour sound level monitoring are shown in Table 1 below. The values for the energy equivalent sound level (Leq), the maximum and minimum measured sound levels (Lmax and Lmin), and the statistical indicators L10, L50, and L90, are given for each monitoring location.

TABLE 1: Measured Ambient Sound Levels – TPM 21030 Residential Development

		1-Hour Noise Level Descriptors in dBA					
Site	**Start Time**	**Leq**	**Lmax**	**Lmin**	**L10**	**L50**	**L90**
ML 1	2:00 p.m.	63.2	70.1	48.7	66.0	62.8	55.2

Monitoring Location:

- ML 1: North portion of project site facing Los Coches Road.
  GPS: 32°50.444'N x 116°54.970'W, EPE 10 ft.

Measurements performed by ISE on January 18. EPE = Estimated Position Error.

The measurements collected at monitoring location ML 1 reflect the typical sound levels associated with the community setting with existing adjacent major roadway activities. The hourly average sound level (or Leq-h) recorded over the monitoring period was 63.2 dBA at ML 1. The dominant noise source was observed to be predominately due to surface road traffic.

As indicated by the monitoring equipment, at least 90 percent of the time (L90) the onsite sound level was approximately 55.2 dBA ML 1 (again indicating the relative frequency of traffic). The acoustic floor for the site, as seen by the Lmin indicators was found to be 48.7 dBA at ML 1. This would be considered the lowest attainable sound levels for the project area near Los Coches Road during daytime hours.

Future Traffic Noise Impacts

The primary sources of future traffic noise near the project site would be from Los Coaches Road. Our project site is identified within zone 13 by SANDAG. Future traffic estimates for this roadway adjacent to our project site predicts volumes for Los Coaches as high as 14,000 ADT (*Source: SANDAG Series 10 - 2030 Enhanced Traffic Volume Forecast – See Attached*). This volume takes into considerations future developments within traffic analysis zone 13 as predicted by the enhanced traffic model.

ISE conducted a speed survey on Los Coaches road and found that the 85th percentile speed is 47 MPH (See Speed Survey Attachment). However, ISE modeled Los Coaches at 50 MPH to be conservative. *California Manual on Uniform Traffic Control Devices* (dated September 26, 2006) as authorized by the California Department of Transportation (CALTRANS) states that roadway speeds must be set to within the nearest 5 MPH increment of the 85th percentile speed.

The results of the acoustical modeling for the selected lots are shown below in Table 2. The table output shows the unmitigated noise sensitive area sound levels modeled with average pavement. The County's Noise Element classifies that any Noise Sensitive Area (NSA) exceeding 60 dBA must be subject to proper mitigation in order to lower the sound levels below 60 dBA.

TABLE 2: Predicted Transportation Noise Levels – TPM 21030 Residential Development

Modeled Receptor No.	Parcel Number and Location.	Ground Levels (dBA)	Second Floor Levels (dBA)
1	Parcel 1 N Facade	64.4	65.5
2	Parcel 1 E Facade	68.0	68.4
3	Parcel 1 S Facade	60.1	64.0
4	Parcel 1 W Facade	37.7	50.9
5	Parcel 2 N Facade	60.7	66.0
6	Parcel 2 E Facade	68.1	68.4
7	Parcel 2 S Facade	62.2	66.8
8	Parcel 2 W Facade	42.4	62.3
9	Parcel 2 Courtyard (NSA)	44.9	64.9
10	Parcel 3 N Façade	64.7	67.3
11	Parcel 3 E Façade	66.5	67.5
12	Parcel 3 S Façade	58.1	64.4
13	Parcel 3 W Façade	42.4	61.2
14	Parcel 3 Courtyard (NSA)	46.4	65.3

Additionally, the County's Noise Element specifies that 10% of the net lot area per parcel must comply with the County's exterior useable area criterion of 60 dBA CNEL. The designed useable area and unobstructed 60 dBA CNEL noise contours are shown for TPM 21030 residential development in Figure 6 on the following page. The identified 60 dBA noise contour would be nearly the same for both first and second floor areas. The modeled receptor results for these areas can be found in Table 3 on Page 14 of this report. Based upon these findings, mitigation would be necessary for the proposed Parcel 1 usable areas.

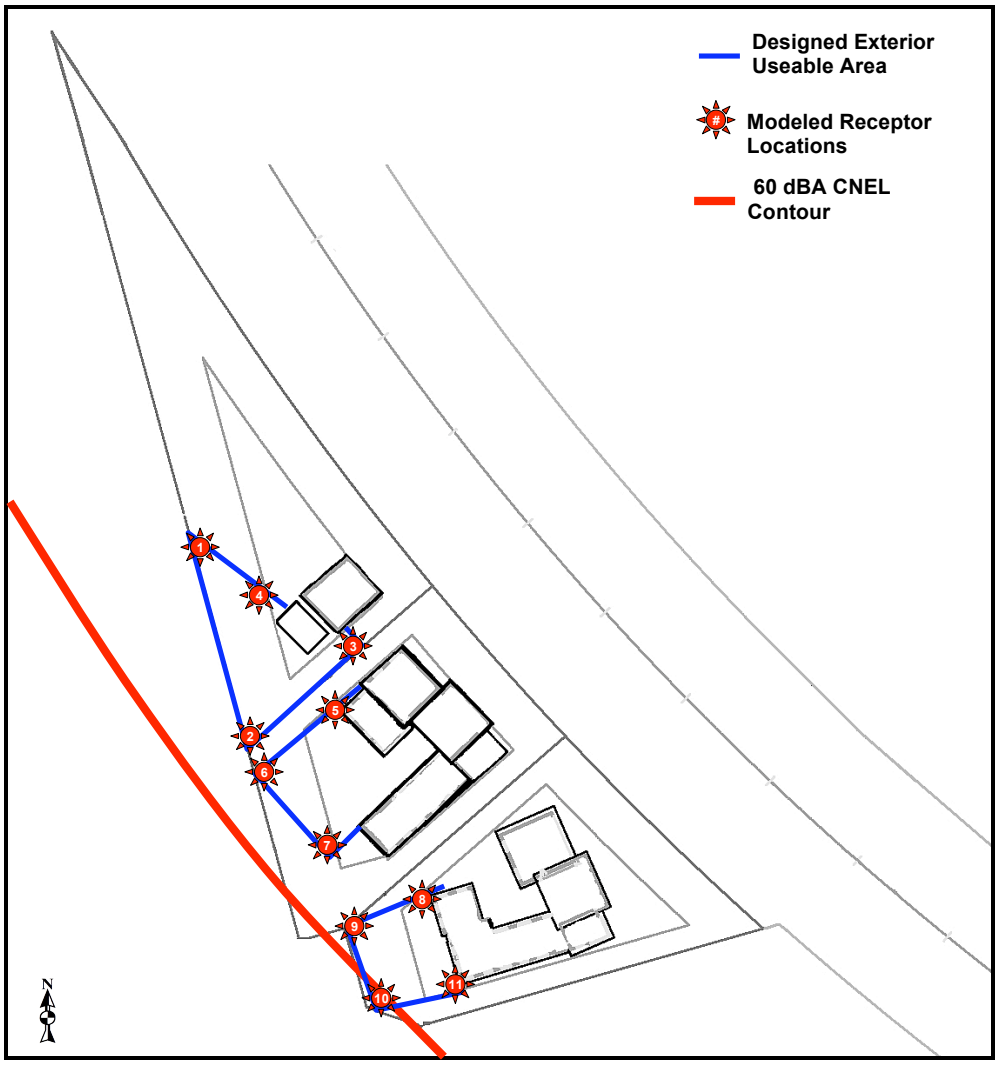


FIGURE 6: Designed Exterior Useable Areas – TPM 21030 Residential Development

Finally, it should be noted that all three aforementioned structures would exceed the CCR Title 24, Noise Insulation Standards as well as Policy 4b interior noise standards and thus would need to be further analyzed in order to demonstrate that the 45 dBA CNEL interior noise threshold can be attained for a closed window condition. Once the project building {architectural} plans are complete, final recommendations can be made in order to ensure these thresholds are met.

Thus, prior to the issuance of building permits for the proposed project, an interior noise analysis compliant with the California Code of Regulations (CCR), Title 24, Noise Insulation Standards should be performed for all affected residential structures identified above. The acoustical analysis should demonstrate that the proposed architectural designs would limit interior noise to 45 dBA CNEL or less.

TABLE 3: Designed Exterior Useable Area Results – TPM 21030 Residential Development

Modeled Receptor No.	Corresponding Parcel No.	Unmitigated Ground Level	Mitigated
1	Parcel 1 Useable Lot N Corner	61.5	60.0
2	Parcel 1 Useable Lot S Corner	56.7	55.4
3	Parcel 1 Useable Lot E Corner	61.0	56.5
4	Parcel 1 Useable Lot NE Corner	61.5	58.3
5	Parcel 2 Useable Lot N Corner	44.1	44.0
6	Parcel 2 Useable Lot W Corner	54.7	54.4
7	Parcel 2 Useable Lot S Corner	44.0	44.1
8	Parcel 3 Useable Lot N Corner	44.0	44.0
9	Parcel 3 Useable Lot W Corner	53.2	53.2
10	Parcel 3 Useable Lot S Corner	52.5	52.5
11	Parcel 3 Useable Lot E Corner	50.2	50.2

A proposed mitigation plan consisting of two five-foot-high walls was examined and found to be adequate to mitigate noise levels under the County's noise thresholds for the northern parcel. The recommended placement of these wall segments is shown in Figure 7 below. The proposed northwest wall should begin at the façade of the building and extend approximately 33 feet at pad elevation. The proposed southeast wall should also begin at the façade of the building and extend approximately 13 feet or until the edge of the parcel's property line (at pad elevation).

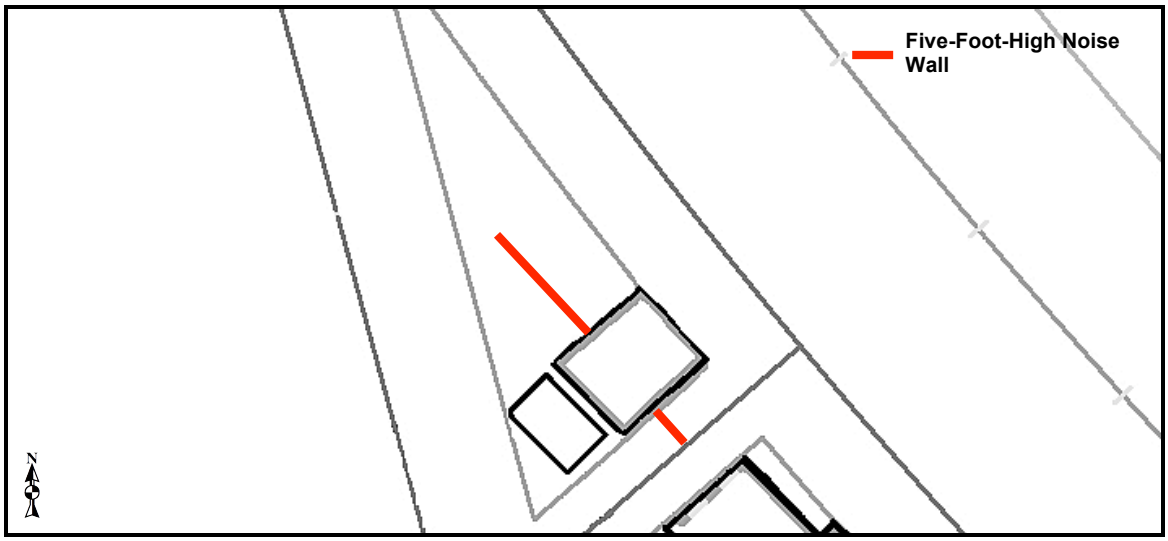


FIGURE 7: Designed Exterior Useable Areas – TPM 21030 Residential Development

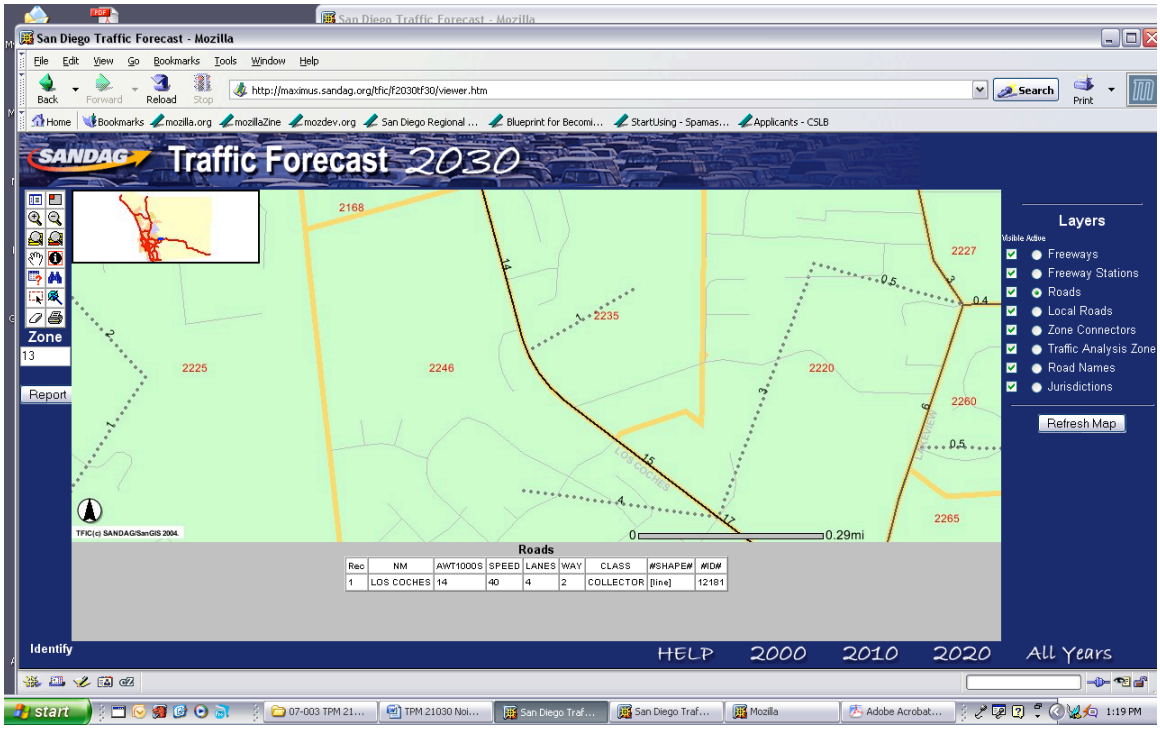
Should you have any questions regarding the findings identified herein, please do not hesitate to contact me at (858) 451-3505.

Sincerely,

Rick Tavares, Ph.D.
Project Principal
Investigative Science and Engineering, Inc.

Cc: Case van Genuchten, ISE

Attachments: SANDAG 2030 Enhanced Traffic Volumes
SANDAG 2030 TAZ 13 data file
TNM 2.5 Model Input/Output Deck
85th Percentile Speed Data (3-13-08 to 3-16-08)



SANDAG 2030 Enhanced Traffic Forecast 2030 Attachment – Screenshot by ISE 3-08

SAN DIEGO REGIONAL TRAFFIC FORECAST

VEHICLE TRIP GENERATION AND LAND USE BY ZONE - YEAR: 2030

TRAFFIC ANALYSIS ZONE : 13

LU Code	Description	Type	Amount	Trips
101	SINGLE FAMILY	du	734	7444
4104	AIRSTRIP	acre	11.4	15
4112	RIGHT-OF-WAY	acre	82.9	0
4113	COMMUNICATION OR UTILITY	acre	18.8	67
6105	FIRE OR POLICE STATION	site	1	332
6701	MILITARY USE	acre	79.8	0
6806	ELEMENTARY SCHOOL	site	1	921
8001	ORCHARDS OR VINEYARD	acre	523.9	47
8002	INTENSIVE AGRICULTURE	acre	34.1	15
8003	FIELD CROPS	acre	224.9	22
9101	INACTIVE USE	acre	15129.7	0
	TOTAL		0	8863

Source: San Diego Association of Governments Traffic Forecast, January 2006

ISE 14 August 2008
Case van Genuchten TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control				
Name	Width	Name	No.	Coordinates (pavement)						Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Los Coches S Lane 2	12.0	point1	1	252.0	806.0	451.00				Average	
		point2	2	306.0	681.0	453.00				Average	
		point3	3	419.0	504.0	458.00				Average	
		point4	4	533.0	365.0	463.00				Average	
		point5	5	665.0	246.0	468.00				Average	
		point6	6	827.0	121.0	467.00					
Los Coches S Lane 1	12.0	point7	7	262.0	806.0	451.00				Average	
		point8	8	316.0	681.0	453.00				Average	
		point9	9	429.0	504.0	458.00				Average	
		point10	10	541.5	369.8	463.00				Average	
		point11	11	673.2	251.1	468.00				Average	
		point12	12	835.2	126.5	467.00					
Los Coches N Lane 1	12.0	point18	18	840.9	133.7	467.00				Average	
		point17	17	678.8	257.3	468.00				Average	
		point16	16	548.5	375.5	463.00				Average	
		point15	15	439.0	504.0	458.00				Average	
		point14	14	326.0	681.0	453.00				Average	
		point13	13	272.0	806.0	451.00					
Los Coches N Lane 2	12.0	point23	23	846.6	140.4	467.00				Average	
		point24	24	683.6	262.5	468.00				Average	
		point22	22	555.0	380.4	463.00				Average	
		point21	21	449.0	504.0	458.00				Average	
		point20	20	336.0	681.0	453.00				Average	
		point19	19	282.0	806.0	451.00					

ISE
Case van Genuchten
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

14 August 2008
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Parcel 1 N Facade	2	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
Parcel 1 E Facade	3	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
Parcel 1 S Facade	6	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
Parcel 1 W Facade	7	1	0.0	37.7	66	37.7	10	----	37.7	0.0	8	-8.0
Parcel 2 N Facade	9	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
Parcel 2 E Facade	10	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Parcel 2 S Facade	11	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
Parcel 2 W Facade	12	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
Parcel 2 Courtyard	13	1	0.0	44.9	66	44.9	10	----	44.9	0.0	8	-8.0
Parcel 3 N Facade	14	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
Parcel 3 E Facade	15	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
Parcel 3 S Facade	16	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
Parcel 3 W Facade	17	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
Parcel 3 Courtyard	18	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
Parcel 1 Useable Lot 1	20	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Parcel 1 Useable Lot 2	21	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
Parcel 1 Useable Lot 3	22	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
Parcel 1 Useable Lot 4	23	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Parcel 2 Useable Lot 1	25	1	0.0	44.1	66	44.1	10	----	44.1	0.0	8	-8.0
Parcel 2 Useable Lot 2	26	1	0.0	54.7	66	54.7	10	----	54.7	0.0	8	-8.0
Parcel 2 Useable Lot 3	27	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
Parcel 3 Useable Lot 1	29	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
Parcel 3 Useable Lot 2	30	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
Parcel 3 Useable Lot 3	31	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0

Parcel 3 Useable Lot 4	32	1	0.0	50.2	66	50.2	10	----	50.2	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		25	0.0	0.0	0.0
All Impacted		3	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0

ISE **14 August 2008**
Case van Genuchten **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **07-003 TPM 21030**
RUN: **1st Floor**

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Parcel 1 Building	W	0.00	99.99	0.00				0.00	point1	1	417.0	409.0	460.00	25.00	0.00	0	0		
									point2	2	403.0	426.0	460.00	25.00	0.00	0	0		
									point3	3	372.0	400.0	460.00	25.00	0.00	0	0		
									point4	4	386.0	385.0	460.00	25.00	0.00	0	0		
									point5	5	416.0	409.0	460.00	25.00					
Parcel 2 Building	W	0.00	99.99	0.00				0.00	point8	8	430.0	393.0	462.00	10.00	0.00	0	0		
									point9	9	473.0	345.0	462.00	10.00	0.00	0	0		
									point10	10	421.0	299.0	462.00	10.00	0.00	0	0		
									point11	11	407.0	312.0	462.00	10.00	0.00	0	0		
									point27	27	441.0	344.0	462.00	10.00	0.00	0	0		
									point26	26	431.0	356.0	462.00	10.00	0.00	0	0		
									point12	12	416.0	342.0	462.00	10.00	0.00	0	0		
									point13	13	398.0	361.0	462.00	10.00	0.00	0	0		
									point14	14	429.0	392.0	462.00	10.00					
Parcel 3 Building	W	0.00	99.99	0.00				0.00	point15	15	451.0	247.0	465.00	10.00	0.00	0	0		
									point16	16	513.0	266.0	465.00	10.00	0.00	0	0		
									point17	17	489.0	319.0	465.00	10.00	0.00	0	0		
									point18	18	465.0	310.0	465.00	10.00	0.00	0	0		
									point19	19	477.0	288.0	465.00	10.00	0.00	0	0		
									point20	20	484.0	291.0	465.00	10.00	0.00	0	0		
									point21	21	490.0	276.0	465.00	10.00	0.00	0	0		
									point22	22	465.0	268.0	465.00	10.00	0.00	0	0		
									point23	23	455.0	287.0	465.00	10.00	0.00	0	0		
									point24	24	438.0	283.0	465.00	10.00	0.00	0	0		
									point25	25	451.0	248.0	465.00	10.00					

ISE 14 August 2008
Case van Genuchten TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Parcel 1 N Facade	2	1	386.0	421.2	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 E Facade	3	1	413.0	420.0	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 S Facade	6	1	399.6	388.8	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 W Facade	7	1	375.1	390.4	460.00	4.92	0.00	66	10.0	8.0	
Parcel 2 N Facade	9	1	412.0	380.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 E Facade	10	1	458.2	366.7	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 S Facade	11	1	457.0	326.5	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 W Facade	12	1	406.6	346.6	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Courtyard	13	1	428.9	342.7	462.00	4.92	0.00	66	10.0	8.0	
Parcel 3 N Facade	14	1	477.0	318.5	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 E Facade	15	1	512.0	288.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 S Facade	16	1	488.0	252.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 W Facade	17	1	440.0	264.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 Courtyard	18	1	473.5	280.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 Useable Lot 1	20	1	345.8	411.9	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 Useable Lot 2	21	1	362.0	351.0	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 Useable Lot 3	22	1	405.0	387.0	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 Useable Lot 4	23	1	363.0	403.7	460.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Useable Lot 1	25	1	396.0	356.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Useable Lot 2	26	1	381.0	342.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Useable Lot 3	27	1	408.0	316.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 3 Useable Lot 1	29	1	437.0	280.0	465.00	4.92	0.00	66	10.0	8.0	Y

Parcel 3 Useable Lot 2	30	1	413.0	274.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 Useable Lot 3	31	1	422.0	240.0	465.00	4.92	0.00	66	10.0	8.0	Y
Parcel 3 Useable Lot 4	32	1	446.0	247.0	465.00	4.92	0.00	66	10.0	8.0	Y

ISE **14 August 2008**
Case van Genuchten **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **07-003 TPM 21030**
RUN: **1st Floor**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Los Coches S Lane 2	point1	1	334	50	7	50	3	50	3	50	3	50
	point2	2	334	50	7	50	3	50	3	50	3	50
	point3	3	334	50	7	50	3	50	3	50	3	50
	point4	4	334	50	7	50	3	50	3	50	3	50
	point5	5	334	50	7	50	3	50	3	50	3	50
	point6	6										
Los Coches S Lane 1	point7	7	334	50	7	50	3	50	3	50	3	50
	point8	8	334	50	7	50	3	50	3	50	3	50
	point9	9	334	50	7	50	3	50	3	50	3	50
	point10	10	334	50	7	50	3	50	3	50	3	50
	point11	11	334	50	7	50	3	50	3	50	3	50
	point12	12										
Los Coches N Lane 1	point18	18	334	50	7	50	3	50	3	50	3	50
	point17	17	334	50	7	50	3	50	3	50	3	50
	point16	16	334	50	7	50	3	50	3	50	3	50
	point15	15	334	50	7	50	3	50	3	50	3	50
	point14	14	334	50	7	50	3	50	3	50	3	50
	point13	13										
Los Coches N Lane 2	point23	23	334	50	7	50	3	50	3	50	3	50
	point24	24	334	50	7	50	3	50	3	50	3	50
	point22	22	334	50	7	50	3	50	3	50	3	50
	point21	21	334	50	7	50	3	50	3	50	3	50
	point20	20	334	50	7	50	3	50	3	50	3	50

	point19	19										

ISE
Case van Genuchten
14 August 2008
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor Mitigated
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Parcel 1 N Facade	2	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
Parcel 1 E Facade	3	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
Parcel 1 S Facade	6	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Parcel 1 W Facade	7	1	0.0	37.7	66	37.7	10	----	37.7	0.0	8	-8.0
Parcel 2 N Facade	9	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
Parcel 2 E Facade	10	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Parcel 2 S Facade	11	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
Parcel 2 W Facade	12	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
Parcel 2 Courtyard	13	1	0.0	44.9	66	44.9	10	----	44.9	0.0	8	-8.0
Parcel 3 N Facade	14	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
Parcel 3 E Facade	15	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
Parcel 3 S Facade	16	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
Parcel 3 W Facade	17	1	0.0	42.4	66	42.4	10	----	42.4	0.0	8	-8.0
Parcel 3 Courtyard	18	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
Parcel 1 Useable Lot 1	20	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
Parcel 1 Useable Lot 2	21	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
Parcel 1 Useable Lot 3	22	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
Parcel 1 Useable Lot 4	23	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
Parcel 2 Useable Lot 1	25	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
Parcel 2 Useable Lot 2	26	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
Parcel 2 Useable Lot 3	27	1	0.0	44.1	66	44.1	10	----	44.1	0.0	8	-8.0
Parcel 3 Useable Lot 1	29	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
Parcel 3 Useable Lot 2	30	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
Parcel 3 Useable Lot 3	31	1	0.0	52.5	66	52.5	10	----	52.5	0.0	8	-8.0

Parcel 3 Useable Lot 4	32	1	0.0	50.2	66	50.2	10	----	50.2	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		25	0.0	0.0	0.0
All Impacted		3	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0

ISE			**14 August 2008**	
Case van Genuchten			**TNM 2.5**	
INPUT: TERRAIN LINES				
PROJECT/CONTRACT:	**07-003 TPM 21030**			
RUN:	**1st Floor Mitigated**			
Terrain Line	**Points**			
Name	**No.**	**Coordinates (ground)**		
		X	**Y**	**Z**
		ft	ft	ft
Terrain Line1	1	800.0	115.0	467.00
	2	680.0	204.0	469.00
	3	558.0	295.0	465.00
	4	428.0	435.0	460.00
	5	355.0	548.0	456.00
	6	281.0	664.0	455.00
	7	225.0	790.0	453.00

ISE **14 August 2008**
Case van Genuchten **TNM 2.5**

INPUT: BARRIERS
PROJECT/CONTRACT: **07-003 TPM 21030**
RUN: **1st Floor Mitigated**

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Parcel 1 Building	W	0.00	99.99	0.00				0.00	point1	1	417.0	409.0	460.00	25.00	0.00	0	0		
									point2	2	403.0	426.0	460.00	25.00	0.00	0	0		
									point3	3	372.0	400.0	460.00	25.00	0.00	0	0		
									point4	4	386.0	385.0	460.00	25.00	0.00	0	0		
									point5	5	416.0	409.0	460.00	25.00					
Parcel 2 Building	W	0.00	99.99	0.00				0.00	point8	8	430.0	393.0	462.00	10.00	0.00	0	0		
									point9	9	473.0	345.0	462.00	10.00	0.00	0	0		
									point10	10	421.0	299.0	462.00	10.00	0.00	0	0		
									point11	11	407.0	312.0	462.00	10.00	0.00	0	0		
									point27	27	441.0	344.0	462.00	10.00	0.00	0	0		
									point26	26	431.0	356.0	462.00	10.00	0.00	0	0		
									point12	12	416.0	342.0	462.00	10.00	0.00	0	0		
									point13	13	398.0	361.0	462.00	10.00	0.00	0	0		
									point14	14	429.0	392.0	462.00	10.00					
Parcel 3 Building	W	0.00	99.99	0.00				0.00	point15	15	451.0	247.0	465.00	10.00	0.00	0	0		
									point16	16	513.0	266.0	465.00	10.00	0.00	0	0		
									point17	17	489.0	319.0	465.00	10.00	0.00	0	0		
									point18	18	465.0	310.0	465.00	10.00	0.00	0	0		
									point19	19	477.0	288.0	465.00	10.00	0.00	0	0		
									point20	20	484.0	291.0	465.00	10.00	0.00	0	0		
									point21	21	490.0	276.0	465.00	10.00	0.00	0	0		
									point22	22	465.0	268.0	465.00	10.00	0.00	0	0		
									point23	23	455.0	287.0	465.00	10.00	0.00	0	0		
									point24	24	438.0	283.0	465.00	10.00	0.00	0	0		
									point25	25	451.0	248.0	465.00	10.00					
Barrier4	W	0.00	99.99	0.00				0.00	point28	28	401.5	397.1	460.00	5.00	0.00	0	0		
									point29	29	409.6	387.2	460.00	5.00					
Barrier6	W	0.00	99.99	0.00				0.00	point30	30	388.3	414.1	460.00	5.00	0.00	0	0		
									point31	31	367.4	439.0	460.00	5.00					

ISE
Case van Genuchten

14 August 2008
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor Mitigated

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Parcel 1 N Facade	2	1	386.0	421.2	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 E Facade	3	1	413.0	420.0	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 S Facade	6	1	399.6	388.8	460.00	4.92	0.00	66	10.0	8.0	
Parcel 1 W Facade	7	1	375.1	390.4	460.00	4.92	0.00	66	10.0	8.0	
Parcel 2 N Facade	9	1	412.0	380.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 E Facade	10	1	458.2	366.7	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 S Facade	11	1	457.0	326.5	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 W Facade	12	1	406.6	346.6	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Courtyard	13	1	428.9	342.7	462.00	4.92	0.00	66	10.0	8.0	
Parcel 3 N Facade	14	1	477.0	318.5	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 E Facade	15	1	512.0	288.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 S Facade	16	1	488.0	252.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 W Facade	17	1	440.0	264.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 Courtyard	18	1	473.5	280.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 1 Useable Lot 1	20	1	345.8	411.9	460.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 Useable Lot 2	21	1	362.0	351.0	460.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 Useable Lot 3	22	1	405.0	387.0	460.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 Useable Lot 4	23	1	363.0	403.7	460.00	4.92	0.00	66	10.0	8.0	Y
Parcel 2 Useable Lot 1	25	1	396.0	356.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Useable Lot 2	26	1	381.0	342.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 2 Useable Lot 3	27	1	408.0	316.0	462.00	4.92	0.00	66	10.0	8.0	
Parcel 3 Useable Lot 1	29	1	437.0	280.0	465.00	4.92	0.00	66	10.0	8.0	

Parcel 3 Useable Lot 2	30	1	413.0	274.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 Useable Lot 3	31	1	422.0	240.0	465.00	4.92	0.00	66	10.0	8.0	
Parcel 3 Useable Lot 4	32	1	446.0	247.0	465.00	4.92	0.00	66	10.0	8.0	

ISE **14 August 2008**
Case van Genuchten **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **07-003 TPM 21030**
RUN: **1st Floor Mitigated**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Los Coches S Lane 2	point1	1	334	50	7	50	3	50	3	50	3	50
	point2	2	334	50	7	50	3	50	3	50	3	50
	point3	3	334	50	7	50	3	50	3	50	3	50
	point4	4	334	50	7	50	3	50	3	50	3	50
	point5	5	334	50	7	50	3	50	3	50	3	50
	point6	6										
Los Coches S Lane 1	point7	7	334	50	7	50	3	50	3	50	3	50
	point8	8	334	50	7	50	3	50	3	50	3	50
	point9	9	334	50	7	50	3	50	3	50	3	50
	point10	10	334	50	7	50	3	50	3	50	3	50
	point11	11	334	50	7	50	3	50	3	50	3	50
	point12	12										
Los Coches N Lane 1	point18	18	334	50	7	50	3	50	3	50	3	50
	point17	17	334	50	7	50	3	50	3	50	3	50
	point16	16	334	50	7	50	3	50	3	50	3	50
	point15	15	334	50	7	50	3	50	3	50	3	50
	point14	14	334	50	7	50	3	50	3	50	3	50
	point13	13										
Los Coches N Lane 2	point23	23	334	50	7	50	3	50	3	50	3	50
	point24	24	334	50	7	50	3	50	3	50	3	50
	point22	22	334	50	7	50	3	50	3	50	3	50
	point21	21	334	50	7	50	3	50	3	50	3	50
	point20	20	334	50	7	50	3	50	3	50	3	50

	point19	19										

ISE 14 August 2008
Case van Genuchten TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 07-003 TPM 21030
RUN: 1st Floor Mitigated

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Los Coches S Lane 2	12.0	point1	1	252.0	806.0	451.00				Average	
		point2	2	306.0	681.0	453.00				Average	
		point3	3	419.0	504.0	458.00				Average	
		point4	4	533.0	365.0	463.00				Average	
		point5	5	665.0	246.0	468.00				Average	
		point6	6	827.0	121.0	467.00					
Los Coches S Lane 1	12.0	point7	7	262.0	806.0	451.00				Average	
		point8	8	316.0	681.0	453.00				Average	
		point9	9	429.0	504.0	458.00				Average	
		point10	10	541.5	369.8	463.00				Average	
		point11	11	673.2	251.1	468.00				Average	
		point12	12	835.2	126.5	467.00					
Los Coches N Lane 1	12.0	point18	18	840.9	133.7	467.00				Average	
		point17	17	678.8	257.3	468.00				Average	
		point16	16	548.5	375.5	463.00				Average	
		point15	15	439.0	504.0	458.00				Average	
		point14	14	326.0	681.0	453.00				Average	
		point13	13	272.0	806.0	451.00					
Los Coches N Lane 2	12.0	point23	23	846.6	140.4	467.00				Average	
		point24	24	683.6	262.5	468.00				Average	
		point22	22	555.0	380.4	463.00				Average	
		point21	21	449.0	504.0	458.00				Average	
		point20	20	336.0	681.0	453.00				Average	
		point19	19	282.0	806.0	451.00					

Investigative and Engineering
SPEED SUMMARY
Thu 3/13/2008

Site Reference: 100000000002
Site ID: 100000000002
Location: Los Coaches Road
Direction: ROAD TOTAL

File: D0313002.prn
City: Lakeside
County: San Diego

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
11:00	0	0	0	1	3	17	62	144	61	9	1	1	0	0	299
12:00	0	0	0	0	6	14	53	166	80	10	1	0	0	0	330
13:00	0	0	0	1	2	17	71	140	84	12	1	0	0	0	328
14:00	1	0	0	0	2	34	98	229	91	5	0	0	1	0	461
15:00	0	0	0	2	6	38	113	264	91	15	3	0	0	0	532
16:00	0	0	1	0	0	25	125	307	119	26	2	0	0	0	605
17:00	1	0	0	0	2	42	86	344	140	12	1	0	0	0	628
18:00	0	0	0	0	5	24	146	294	93	12	0	0	0	0	574
19:00	0	0	0	0	1	37	113	198	66	12	0	0	0	0	427
20:00	0	0	0	1	3	28	115	143	51	2	0	0	0	0	343
21:00	0	0	0	0	5	14	35	107	33	8	0	0	0	0	202
22:00	0	0	0	0	3	10	42	70	30	3	2	0	0	0	160
23:00	0	0	0	0	1	6	20	32	15	3	1	0	0	0	78
24:00	0	0	0	1	0	1	9	11	12	2	0	0	0	0	36
DAY TOTAL	2	0	1	6	39	307	1088	2449	966	131	12	1	1	0	5003
PERCENTS	0.1%	0.0%	0.1%	0.2%	0.8%	6.1%	21.7%	48.9%	19.3%	2.6%	0.2%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
36.8 mph

Median Speed
42.2 mph

10 MPH Pace Speed
35 mph to 45 mph
3537 vehicles in pace
Representing 70.6% of the total vehicles

85th Percentile Speed
46.9 mph

Average Speed
41.9 mph

Vehicles > 65 MPH
1
0.0%

Investigative and Engineering
SPEED SUMMARY
Fri 3/14/2008

Site Reference: 100000000002
Site ID: 100000000002
Location: Los Coaches Road
Direction: ROAD TOTAL

File: D0313002.prn
City: Lakeside
County: San Diego

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	1	0	1	0	0	9	10	5	5	1	0	0	0	32
02:00	0	0	0	0	0	1	3	7	5	0	1	0	0	0	17
03:00	0	0	0	0	1	2	6	4	4	2	0	0	0	0	19
04:00	0	0	0	0	0	0	2	9	10	3	2	0	0	0	26
05:00	0	0	0	0	0	2	9	43	21	8	0	0	1	0	84
06:00	0	0	0	0	1	15	30	77	51	11	0	0	0	0	185
07:00	0	0	0	0	0	14	59	140	76	10	0	0	0	0	299
08:00	0	0	0	0	2	23	77	175	77	9	1	0	0	0	364
09:00	0	0	0	1	5	33	97	173	55	5	1	0	0	0	370
10:00	0	0	0	0	2	11	65	142	63	4	0	1	0	0	288
11:00	0	0	0	0	3	17	110	124	63	12	0	0	0	0	329
12:00	0	0	1	0	2	20	132	194	67	10	0	0	0	0	426
13:00	0	0	0	0	2	20	77	189	74	20	3	0	0	0	385
14:00	0	1	0	0	6	41	122	263	72	10	1	0	0	0	516
15:00	0	0	0	0	6	35	157	299	78	16	1	0	0	0	592
16:00	0	0	0	0	3	35	159	295	110	20	0	0	0	0	622
17:00	0	1	0	0	6	61	141	354	121	20	1	0	0	0	705
18:00	0	0	0	0	6	42	181	319	111	7	0	0	0	0	666
19:00	0	0	0	1	4	27	126	191	70	8	0	0	0	0	427
20:00	0	0	0	0	7	50	84	158	37	1	0	0	0	0	337
21:00	0	0	0	0	7	23	66	112	33	1	2	0	1	0	245
22:00	0	0	0	0	2	10	39	85	30	3	2	0	0	0	171
23:00	0	0	0	0	1	10	24	56	25	0	1	0	0	0	117
24:00	0	0	0	0	1	2	17	39	9	2	1	0	0	0	71
DAY TOTAL	0	3	1	3	67	494	1792	3458	1267	187	18	1	2	0	7293
PERCENTS	0.0%	0.1%	0.1%	0.1%	1.0%	6.8%	24.5%	47.4%	17.3%	2.5%	0.2%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
36.5 mph

Median Speed
41.9 mph

10 MPH Pace Speed
35 mph to 45 mph
5250 vehicles in pace
Representing 71.9% of the total vehicles

85th Percentile Speed
46.5 mph

Average Speed
41.6 mph

Vehicles > 65 MPH
2
0.0%

Site Reference: 100000000002
Site ID: 100000000002
Location: Los Coaches Road
Direction: ROAD TOTAL

File: D0313002.prn
City: Lakeside
County: San Diego

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	1	2	7	9	9	5	1	0	0	0	34
02:00	0	0	0	0	0	2	7	10	6	4	1	0	0	0	30
03:00	0	0	0	0	0	1	5	4	5	1	5	0	0	0	21
04:00	0	0	0	0	0	3	3	7	8	4	0	0	1	0	26
05:00	0	0	0	0	0	3	6	12	5	0	0	0	0	1	27
06:00	0	0	0	0	0	2	9	26	12	4	0	0	0	0	53
07:00	0	0	0	1	0	5	32	57	13	13	1	0	0	0	122
08:00	0	0	0	0	1	12	48	126	44	11	0	0	0	0	242
09:00	0	0	0	1	0	19	76	163	47	9	1	0	0	0	316
10:00	0	1	0	0	3	14	107	191	81	12	0	0	0	0	409
11:00	0	1	0	2	2	15	74	216	88	20	0	0	0	0	418
12:00	0	1	0	1	8	44	100	197	79	14	0	0	0	0	444
13:00	0	0	0	1	7	31	104	239	91	9	0	0	0	0	482
14:00	0	0	0	0	9	24	111	202	81	15	0	0	0	0	442
15:00	0	0	0	0	3	16	72	241	79	17	2	0	0	0	430
16:00	0	0	0	2	2	19	91	168	103	15	0	0	0	0	400
17:00	0	0	0	0	2	26	71	198	95	12	2	0	0	0	406
18:00	0	0	0	0	1	17	79	151	107	7	1	0	0	0	363
19:00	0	0	0	0	2	15	86	133	65	17	2	0	0	0	320
20:00	0	0	0	0	7	17	63	125	31	3	0	0	0	0	246
21:00	0	0	0	0	1	9	66	81	37	3	1	0	0	0	198
22:00	0	0	0	1	3	13	33	56	20	4	0	0	0	0	130
23:00	0	0	0	0	0	4	19	55	27	2	1	0	0	0	108
24:00	0	0	0	2	1	5	9	28	16	9	0	0	0	0	70
DAY TOTAL	0	3	0	11	53	318	1278	2695	1149	210	18	0	1	1	5737
PERCENTS	0.0%	0.1%	0.0%	0.2%	1.0%	5.6%	22.3%	46.9%	20.0%	3.6%	0.3%	0.0%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
36.9 mph

85th Percentile Speed
47.3 mph

Median Speed
42.2 mph

Average Speed
42.1 mph

10 MPH Pace Speed
35 mph to 45 mph
3973 vehicles in pace
Representing 69.2% of the total vehicles

Vehicles > 65 MPH
2
0.0%

Site Reference: 100000000002
Site ID: 100000000002
Location: Los Coaches Road
Direction: ROAD TOTAL

File: D0313002.prn
City: Lakeside
County: San Diego

TIME	10	15	20	25	30	35	40	45	50	55	60	65	70	71+	Total
01:00	0	0	0	0	1	6	13	21	15	5	1	0	0	0	62
02:00	0	0	0	0	0	3	7	11	7	1	0	0	0	0	29
03:00	0	0	0	0	0	2	5	9	6	4	0	0	0	0	26
04:00	0	0	0	0	0	1	5	3	3	0	1	1	0	0	14
05:00	0	0	0	0	0	0	4	10	4	3	0	1	0	0	22
06:00	0	0	0	0	0	3	8	18	9	4	1	0	0	0	43
07:00	0	0	0	0	0	3	14	29	22	2	0	0	0	0	70
08:00	0	0	0	1	0	10	29	84	53	11	0	0	0	0	188
09:00	0	0	0	0	0	10	50	99	70	9	2	1	0	0	241
10:00	0	0	0	0	2	6	77	150	65	13	1	0	0	0	314
11:00	0	0	1	1	3	10	104	193	71	11	0	0	0	0	394
12:00	0	0	0	0	3	13	92	166	79	15	1	0	0	0	369
13:00	0	0	0	0	1	21	102	183	75	11	0	0	0	0	393
14:00	0	0	1	0	4	21	87	122	87	19	1	0	0	0	342
15:00	0	0	0	0	0	19	63	173	100	9	1	1	0	0	366
16:00	0	0	0	0	3	14	76	143	97	10	2	0	0	0	345
17:00	1	0	0	0	3	11	50	168	93	18	3	0	0	0	347
18:00	0	0	0	0	3	9	54	134	86	22	1	0	0	0	309
19:00	1	0	0	0	7	29	67	144	58	9	4	1	0	0	320
20:00	0	0	0	0	5	9	59	90	34	6	0	0	0	0	203
21:00	0	0	1	0	0	10	50	64	40	9	1	0	0	0	175
22:00	0	0	1	0	0	6	21	61	29	5	0	0	0	0	123
23:00	0	0	0	0	0	2	10	24	19	4	1	0	0	0	60
24:00	0	0	0	0	0	1	7	14	9	2	2	2	0	0	37
DAY TOTAL	2	0	4	2	35	219	1054	2113	1131	202	23	7	0	0	4792
PERCENTS	0.1%	0.0%	0.1%	0.1%	0.8%	4.6%	22.0%	44.0%	23.6%	4.2%	0.4%	0.1%	0.0%	0.0%	100%

Statistical Information...

15th Percentile Speed
37.2 mph

Median Speed
42.6 mph

10 MPH Pace Speed
40 mph to 50 mph
3244 vehicles in pace
Representing 67.6% of the total vehicles

85th Percentile Speed
47.9 mph

Average Speed
42.5 mph

Vehicles > 65 MPH
0
0.0%